



#4/a

- 1 -

SEQUENCE LISTING

(1) GENERAL INFORMATION:

- (i) APPLICANT: CHOU, Tau-San
EISENREICH, Robert
SANFORD, John
BLOWERS, Alan
SMITH, Franzine
VAN ECK, Joyce
- (ii) TITLE OF INVENTION: PRODUCTION OF TRANSGENIC POINSETTIA
- (iii) NUMBER OF SEQUENCES: 23
- (iv) CORRESPONDENCE ADDRESS:
 - (A) ADDRESSEE: Foley & Lardner
 - (B) STREET: 3000 K Street, N.W., Suite 500
 - (C) CITY: Washington
 - (D) STATE: D.C.
 - (E) COUNTRY: USA
 - (F) ZIP: 20007-5109
- (v) COMPUTER READABLE FORM:
 - (A) MEDIUM TYPE: Floppy disk
 - (B) COMPUTER: IBM PC compatible
 - (C) OPERATING SYSTEM: PC-DOS/MS-DOS
 - (D) SOFTWARE: PatentIn Release #1.0, Version #1.30
- (vi) CURRENT APPLICATION DATA:
 - (A) APPLICATION NUMBER: US 08/903,944
 - (B) FILING DATE: 31-JUL-1997
 - (C) CLASSIFICATION:
- (viii) ATTORNEY/AGENT INFORMATION:
 - (A) NAME: GRANADOS, Patricia D.
 - (B) REGISTRATION NUMBER: 33,683
 - (C) REFERENCE/DOCKET NUMBER: 89166/107
- (ix) TELECOMMUNICATION INFORMATION:
 - (A) TELEPHONE: (202)672-5300
 - (B) TELEFAX: (202)672-5399
 - (C) TELEX: 904136

(2) INFORMATION FOR SEQ ID NO:1:

- (i) SEQUENCE CHARACTERISTICS:
 - (A) LENGTH: 23 amino acids
 - (B) TYPE: amino acid
 - (C) STRANDEDNESS: single
 - (D) TOPOLOGY: linear

(xi) SEQUENCE DESCRIPTION: SEQ ID NO:1:

Gly Ile Gly Lys Phe Leu His Ser Ala Lys Lys Phe Gly Lys Ala Phe
1 5 10 15

Val Gly Glu Ile Met Asn Ser
20

(2) INFORMATION FOR SEQ ID NO:2:

- (i) SEQUENCE CHARACTERISTICS:
 (A) LENGTH: 21 amino acids
 (B) TYPE: amino acid
 (C) STRANDEDNESS: single
 (D) TOPOLOGY: linear

(xi) SEQUENCE DESCRIPTION: SEQ ID NO:2:

Gly Met Ala Ser Lys Ala Gly Ala Ile Ala Gly Lys Ile Ala Lys Val
1 5 10 15

Ala Leu Lys Ala Leu
 20

(2) INFORMATION FOR SEQ ID NO:3:

- (i) SEQUENCE CHARACTERISTICS:
 (A) LENGTH: 22 amino acids
 (B) TYPE: amino acid
 (C) STRANDEDNESS: single
 (D) TOPOLOGY: linear

(xi) SEQUENCE DESCRIPTION: SEQ ID NO:3:

Gly Ile Gly Lys Phe Leu Lys Ser Ala Lys Lys Phe Gly Lys Ala Phe
1 5 10 15

Val Lys Ile Leu Asn Ser
 20

(2) INFORMATION FOR SEQ ID NO:4:

- (i) SEQUENCE CHARACTERISTICS:
 (A) LENGTH: 21 amino acids
 (B) TYPE: amino acid
 (C) STRANDEDNESS: single
 (D) TOPOLOGY: linear

(xi) SEQUENCE DESCRIPTION: SEQ ID NO:4:

Lys Ile Ala Gly Lys Ile Ala Lys Ile Ala Gly Lys Ile Ala Lys Ile
1 5 10 15

Ala Gly Lys Ile Ala
 20

(2) INFORMATION FOR SEQ ID NO:5:

- (i) SEQUENCE CHARACTERISTICS:
 (A) LENGTH: 27 amino acids
 (B) TYPE: amino acid
 (C) STRANDEDNESS: single
 (D) TOPOLOGY: linear

(xi) SEQUENCE DESCRIPTION: SEQ ID NO:5:

Lys Arg Lys Arg Ala Val Lys Arg Val Gly Arg Arg Leu Lys Lys Leu
1 5 10 15

Ala Arg Lys Ile Ala Arg Leu Gly Val Ala Phe
20 25

(2) INFORMATION FOR SEQ ID NO:6:

- (i) SEQUENCE CHARACTERISTICS:
 (A) LENGTH: 75 base pairs
 (B) TYPE: nucleic acid
 (C) STRANDEDNESS: single
 (D) TOPOLOGY: linear

(ix) FEATURE:

- (A) NAME/KEY: CDS
 (B) LOCATION: 1..72

(ix) FEATURE:

- (A) NAME/KEY: mat_peptide
 (B) LOCATION: 1..72

(xi) SEQUENCE DESCRIPTION: SEQ ID NO:6:

ATG GGC ATC GGA AAG TTC CTT CAC AGT GCA AAG AAG TTC GGA AAG GCC 48
 Met Gly Ile Gly Lys Phe Leu His Ser Ala Lys Lys Phe Gly Lys Ala
1 5 10 15

TTC GTG GGT GAG ATC ATG AAC AGT TAA 75
 Phe Val Gly Glu Ile Met Asn Ser
20

(2) INFORMATION FOR SEQ ID NO:7:

- (i) SEQUENCE CHARACTERISTICS:
 (A) LENGTH: 24 amino acids
 (B) TYPE: amino acid
 (D) TOPOLOGY: linear

(ii) MOLECULE TYPE: protein

(xi) SEQUENCE DESCRIPTION: SEQ ID NO:7:

Met Gly Ile Gly Lys Phe Leu His Ser Ala Lys Lys Phe Gly Lys Ala
1 5 10 15

Phe Val Gly Glu Ile Met Asn Ser
20

(2) INFORMATION FOR SEQ ID NO:8:

- (i) SEQUENCE CHARACTERISTICS:
 (A) LENGTH: 72 base pairs
 (B) TYPE: nucleic acid
 (C) STRANDEDNESS: single
 (D) TOPOLOGY: linear

```
(ix) FEATURE:
      (A) NAME/KEY: mat_peptide
      (B) LOCATION: 1..69
```

| | | | | | | | | | | | | | | | |
|-----|-----|-----|-----|-----|-----|-----|-----|-----|-----|-----|-----|-----|-----|-----|-----|
| ATG | GGA | ATC | GGC | AAG | TTC | CTC | AAG | AGC | GCA | AAG | AAG | TTT | GGC | AAG | GCC |
| Met | Gly | Ile | Gly | Lys | Phe | Leu | Lys | Ser | Ala | Lys | Lys | Phe | Gly | Lys | Ala |
| 1 | | | | 5 | | | | | 10 | | | | | 15 | |
| | | | | | | | | | | | | | | | |
| TTC | GTG | AAG | ATC | CTG | AAC | TCC | TAA | | | | | | | | |
| Phe | Val | Lys | Ile | Leu | Asn | Ser | | | | | | | | | |
| | | | 20 | | | | | | | | | | | | |

(i) SEQUENCE CHARACTERISTICS:

- (A) LENGTH: 23 amino acids
- (B) TYPE: amino acid
- (D) TOPOLOGY: linear

(xi) SEQUENCE DESCRIPTION: SEQ ID NO:9:

Met Gly Ile Gly Lys Phe Leu Lys Ser Ala Lys Lys Phe Gly Lys Ala
1 5 10 15
Phe Val Lys Ile Leu Asn Ser
20

(i) SEQUENCE CHARACTERISTICS:
(A) LENGTH: 69 base pairs
(B) TYPE: nucleic acid
(C) STRANDEDNESS: single
(D) TOPOLOGY: linear

```
(ix) FEATURE:
      (A) NAME/KEY: mat_peptide
      (B) LOCATION: 1..66
```

(xi) SEQUENCE DESCRIPTION: SEQ ID NO:10:

[illegible]

(2) INFORMATION FOR SEQ ID NO:11:

- (i) SEQUENCE CHARACTERISTICS:
 - (A) LENGTH: 22 amino acids
 - (B) TYPE: amino acid
 - (D) TOPOLOGY: linear

(ii) MOLECULE TYPE: protein

(xi) SEQUENCE DESCRIPTION: SEQ ID NO:11:

```
Met Lys Ile Ala Gly Lys Ile Ala Lys Ile Ala Gly Lys Ile Ala Lys
 1           5           10           15
Ile Ala Gly Lys Ile Ala
                20
```

(2) INFORMATION FOR SEQ ID NO:12:

- (i) SEQUENCE CHARACTERISTICS:
 - (A) LENGTH: 84 base pairs
 - (B) TYPE: nucleic acid
 - (C) STRANDEDNESS: single
 - (D) TOPOLOGY: linear

(ix) FEATURE:

- (A) NAME/KEY: CDS
- (B) LOCATION: 1..81

(ix) FEATURE:

- (A) NAME/KEY: mat_peptide
- (B) LOCATION: 1..81

(xi) SEQUENCE DESCRIPTION: SEQ ID NO:12:

```
ATG AAG AGG AAG CGT GCA GTT AAG AGG GTG GGA CGT CGA TTG AAG CTT      48
Met Lys Arg Lys Arg Ala Val Lys Arg Val Gly Arg Arg Leu Lys Leu
 1           5           10           15

GCA AGA AAG ATC GCA AGG CTC GGT GTG GCT TTC TAA      84
Ala Arg Lys Ile Ala Arg Leu Gly Val Ala Phe
                20           25
```

(2) INFORMATION FOR SEQ ID NO:13:

- (i) SEQUENCE CHARACTERISTICS:
 - (A) LENGTH: 27 amino acids
 - (B) TYPE: amino acid
 - (D) TOPOLOGY: linear

(ii) MOLECULE TYPE: protein

(xi) SEQUENCE DESCRIPTION: SEQ ID NO:13:

```
Met Lys Arg Lys Arg Ala Val Lys Arg Val Gly Arg Arg Leu Lys Leu
 1           5           10           15
Ala Arg Lys Ile Ala Arg Leu Gly Val Ala Phe
                20           25
```

(2) INFORMATION FOR SEQ ID NO:14:

- (i) SEQUENCE CHARACTERISTICS:
 (A) LENGTH: 120 base pairs
 (B) TYPE: nucleic acid
 (C) STRANDEDNESS: single
 (D) TOPOLOGY: linear

- (ix) FEATURE:
 (A) NAME/KEY: CDS
 (B) LOCATION: 1..117

- (ix) FEATURE:
 (A) NAME/KEY: mat_peptide
 (B) LOCATION: 1..117

(xi) SEQUENCE DESCRIPTION: SEQ ID NO:14:

| | | | | | | | | | | | | | | | | |
|-----|-----|-----|-----|-----|-----|-----|-----|-----|-----|-----|-----|-----|-----|-----|-----|-----|
| ATG | CTT | CTC | GCT | ATT | GCC | TTC | TTG | GCA | TCA | GTT | TGC | GTG | TCT | TCC | ATG | 48 |
| Met | Leu | Leu | Ala | Ile | Ala | Phe | Leu | Ala | Ser | Val | Cys | Val | Ser | Ser | Met | |
| 1 | | | | 5 | | | | 10 | | | | | | 15 | | |
| GGC | ATC | GGA | AAG | TTC | CTT | CAC | AGT | GCA | AAG | AAG | TTC | GGA | AAG | GCC | TTC | 96 |
| Gly | Ile | Gly | Lys | Phe | Leu | His | Ser | Ala | Lys | Lys | Phe | Gly | Lys | Ala | Phe | |
| | | | 20 | | | | | 25 | | | | | 30 | | | |
| GTG | GGT | GAG | ATC | ATG | AAC | AGT | TAA | | | | | | | | | 120 |
| Val | Gly | Glu | Ile | Met | Asn | Ser | | | | | | | | | | |
| | | | 35 | | | | | | | | | | | | | |

(2) INFORMATION FOR SEQ ID NO:15:

- (i) SEQUENCE CHARACTERISTICS:
 (A) LENGTH: 39 amino acids
 (B) TYPE: amino acid
 (D) TOPOLOGY: linear

- (ii) MOLECULE TYPE: protein

(xi) SEQUENCE DESCRIPTION: SEQ ID NO:15:

| | | | | | | | | | | | | | | | |
|-----|-----|-----|-----|-----|-----|-----|-----|-----|-----|-----|-----|-----|-----|-----|-----|
| Met | Leu | Leu | Ala | Ile | Ala | Phe | Leu | Ala | Ser | Val | Cys | Val | Ser | Ser | Met |
| 1 | | | | 5 | | | | 10 | | | | | | 15 | |
| Gly | Ile | Gly | Lys | Phe | Leu | His | Ser | Ala | Lys | Lys | Phe | Gly | Lys | Ala | Phe |
| | | | 20 | | | | | 25 | | | | | 30 | | |
| Val | Gly | Glu | Ile | Met | Asn | Ser | | | | | | | | | |
| | | | 35 | | | | | | | | | | | | |

(2) INFORMATION FOR SEQ ID NO:16:

- (i) SEQUENCE CHARACTERISTICS:
 (A) LENGTH: 111 base pairs
 (B) TYPE: nucleic acid
 (C) STRANDEDNESS: single
 (D) TOPOLOGY: linear

- (ix) FEATURE:
 (A) NAME/KEY: CDS
 (B) LOCATION: 1..108

(ix) FEATURE:
 (A) NAME/KEY: mat_peptide
 (B) LOCATION: 1..108

(xi) SEQUENCE DESCRIPTION: SEQ ID NO:16:

| | | | | | | | | | | | | | | | | |
|-----|-----|-----|-----|-----|-----|-----|-----|-----|-----|-----|-----|-----|-----|-----|-----|-----|
| ATG | CTT | CTC | GCT | ATT | GCC | TTC | TTG | GCA | TCA | GTT | TGC | GTG | TCT | TCC | GGA | 48 |
| Met | Leu | Leu | Ala | Ile | Ala | Phe | Leu | Ala | Ser | Val | Cys | Val | Ser | Ser | Gly | |
| 1 | | | | 5 | | | | 10 | | | | | 15 | | | |
| | | | | | | | | | | | | | | | | |
| ATG | GCC | TCT | AAG | GCA | GGT | GCT | ATC | GCC | GGC | AAA | ATC | GCG | AAG | GTG | GCA | 96 |
| Met | Ala | Ser | Lys | Ala | Gly | Ala | Ile | Ala | Gly | Lys | Ile | Ala | Lys | Val | Ala | |
| | | | 20 | | | | | 25 | | | | | 30 | | | |
| | | | | | | | | | | | | | | | | |
| TTG | AAG | GCC | CTT | TAA | | | | | | | | | | | | 111 |
| Leu | Lys | Ala | Leu | | | | | | | | | | | | | |
| | | | 35 | | | | | | | | | | | | | |

(2) INFORMATION FOR SEQ ID NO:17:

(i) SEQUENCE CHARACTERISTICS:
 (A) LENGTH: 36 amino acids
 (B) TYPE: amino acid
 (D) TOPOLOGY: linear

(ii) MOLECULE TYPE: protein

(xi) SEQUENCE DESCRIPTION: SEQ ID NO:17:

| | | | | | | | | | | | | | | | |
|-----|-----|-----|-----|-----|-----|-----|-----|-----|-----|-----|-----|-----|-----|-----|-----|
| Met | Leu | Leu | Ala | Ile | Ala | Phe | Leu | Ala | Ser | Val | Cys | Val | Ser | Ser | Gly |
| 1 | | | | 5 | | | | 10 | | | | | 15 | | |
| | | | | | | | | | | | | | | | |
| Met | Ala | Ser | Lys | Ala | Gly | Ala | Ile | Ala | Gly | Lys | Ile | Ala | Lys | Val | Ala |
| | | | 20 | | | | | 25 | | | | | 30 | | |
| | | | | | | | | | | | | | | | |
| Leu | Lys | Ala | Leu | | | | | | | | | | | | |
| | | | 35 | | | | | | | | | | | | |

(2) INFORMATION FOR SEQ ID NO:18:

(i) SEQUENCE CHARACTERISTICS:
 (A) LENGTH: 117 base pairs
 (B) TYPE: nucleic acid
 (C) STRANDEDNESS: single
 (D) TOPOLOGY: linear

(ix) FEATURE:
 (A) NAME/KEY: CDS
 (B) LOCATION: 1..114

(ix) FEATURE:
 (A) NAME/KEY: mat_peptide
 (B) LOCATION: 1..114

(xi) SEQUENCE DESCRIPTION: SEQ ID NO:18:

| | | | | | | | | | | | | | | | | |
|-----|-----|-----|-----|-----|-----|-----|-----|-----|-----|-----|-----|-----|-----|-----|-----|----|
| ATG | CTT | CTC | GCT | ATT | GCC | TTC | TTG | GCA | TCA | GTT | TGC | GTG | TCT | TCC | ATG | 48 |
| Met | Leu | Leu | Ala | Ile | Ala | Phe | Leu | Ala | Ser | Val | Cys | Val | Ser | Ser | Met | |
| 1 | | | | 5 | | | | 10 | | | | | 15 | | | |

GGA ATC GGC AAG TTC CTC AAG AGC GCA AAG AAG TTT GGC AAG GCC TTC 96
Gly Ile Gly Lys Phe Leu Lys Ser Ala Lys Lys Phe Gly Lys Ala Phe
20 25 30

GTG AAG ATC CTG AAC TCC TAA 117
Val Lys Ile Leu Asn Ser
35

(2) INFORMATION FOR SEQ ID NO:19:

- (i) SEQUENCE CHARACTERISTICS:
(A) LENGTH: 38 amino acids
(B) TYPE: amino acid
(D) TOPOLOGY: linear

(ii) MOLECULE TYPE: protein

(xi) SEQUENCE DESCRIPTION: SEQ ID NO:19:

Met Leu Leu Ala Ile Ala Phe Leu Ala Ser Val Cys Val Ser Ser Met
1 5 10 15
Gly Ile Gly Lys Phe Leu Lys Ser Ala Lys Lys Phe Gly Lys Ala Phe
20 25 30
Val Lys Ile Leu Asn Ser
35

(2) INFORMATION FOR SEQ ID NO:20:

- (i) SEQUENCE CHARACTERISTICS:
(A) LENGTH: 111 base pairs
(B) TYPE: nucleic acid
(C) STRANDEDNESS: single
(D) TOPOLOGY: linear

(ix) FEATURE:
(A) NAME/KEY: CDS
(B) LOCATION: 1..108

(ix) FEATURE:
(A) NAME/KEY: mat_peptide
(B) LOCATION: 1..108

(xi) SEQUENCE DESCRIPTION: SEQ ID NO:20:

ATG CTT CTC GCT ATT GCC TTC TTG GCA TCA GTT TGC GTG TCT TCC AAG 48
Met Leu Leu Ala Ile Ala Phe Leu Ala Ser Val Cys Val Ser Ser Lys
1 5 10 15
ATC GCC GGA AAG ATA GCA AAG ATT GCG GGG AAA ATC GCG AAG ATC GCT 96
Ile Ala Gly Lys Ile Ala Lys Ile Ala Gly Lys Ile Ala Lys Ile Ala
20 25 30
GGC AAA ATC GCG TAA 111
Gly Lys Ile Ala
35

(2) INFORMATION FOR SEQ ID NO:21:

- (i) SEQUENCE CHARACTERISTICS:
 (A) LENGTH: 36 amino acids
 (B) TYPE: amino acid
 (D) TOPOLOGY: linear

(ii) MOLECULE TYPE: protein

(xi) SEQUENCE DESCRIPTION: SEQ ID NO:21:

```
Met Leu Leu Ala Ile Ala Phe Leu Ala Ser Val Cys Val Ser Ser Lys
 1             5             10             15
Ile Ala Gly Lys Ile Ala Lys Ile Ala Gly Lys Ile Ala Lys Ile Ala
      20             25             30
Gly Lys Ile Ala
      35
```

(2) INFORMATION FOR SEQ ID NO:22:

- (i) SEQUENCE CHARACTERISTICS:
 (A) LENGTH: 129 base pairs
 (B) TYPE: nucleic acid
 (C) STRANDEDNESS: single
 (D) TOPOLOGY: linear

(ix) FEATURE:
 (A) NAME/KEY: CDS
 (B) LOCATION: 1..126

(ix) FEATURE:
 (A) NAME/KEY: mat_peptide
 (B) LOCATION: 1..126

(xi) SEQUENCE DESCRIPTION: SEQ ID NO:22:

```
ATG CTT CTC GCT ATT GCC TTC TTG GCA TCA GTT TGC GTG TCT TCC AAG      48
Met Leu Leu Ala Ile Ala Phe Leu Ala Ser Val Cys Val Ser Ser Lys
 1             5             10             15
AGG AAG CGT GCA GTT AAG AGG GTG GGA CGT CGA TTG AAG AAG CTT GCA      96
Arg Lys Arg Ala Val Lys Arg Val Gly Arg Arg Leu Lys Lys Leu Ala
      20             25             30
AGA AAG ATC GCA AGG CTC GGT GTG GCT TTC TAA      129
Arg Lys Ile Ala Arg Leu Gly Val Ala Phe
      35             40
```

(2) INFORMATION FOR SEQ ID NO:23:

- (i) SEQUENCE CHARACTERISTICS:
 (A) LENGTH: 42 amino acids
 (B) TYPE: amino acid
 (D) TOPOLOGY: linear

(ii) MOLECULE TYPE: protein

(xi) SEQUENCE DESCRIPTION: SEQ ID NO:23:

Met Leu Leu Ala Ile Ala Phe Leu Ala Ser Val Cys Val Ser Ser Lys
1 5 10 15
Arg Lys Arg Ala Val Lys Arg Val Gly Arg Arg Leu Lys Lys Leu Ala
20 25 30
Arg Lys Ile Ala Arg Leu Gly Val Ala Phe
35 40